

FURTHER DESCRIPTIONS OF UPPER SILURIAN
FOSSILS FROM THE LILYDALE LIMESTONE, UPPER
YARRA DISTRICT, VICTORIA.

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(Plates xviii. — xix.)

THE additional fossils about to be described, are like the former collection,* obtained by Mr. A. J. North, from the Cave-hill Quarries, Lilydale, Victoria.

When publishing the former descriptions I overlooked a short account of the Lilydale Limestone by the Rev. A. W. Cresswell,† who gives the following particulars regarding it. The limestone is about one hundred feet thick, interstratified with the Upper Silurian rocks of the district. It is believed to be a lenticular patch, the prevailing colour being cream. As regards the fossil contents Mr. Cresswell makes the following remarks:—"Several specimens of a sub-genus of *Turbo*, one of them being as large as a good sized recent *Turbo undulatus*. The form appears to me to be close to *Enchelus*, there being no umbilicus or the columella showing trace of being toothed, it is very like our common recent *Enchelus canaliculatus*, but has finer and more numerous liræ. The nearest shell to it in Murchison's "Siluria," appears to be *Cyclonema corallii* of the Upper Ludlow, with which it is perhaps identical. Several specimens of *Murchisonia*, apparently corresponding to *M. corallii* of the Upper Ludlow, as figured in Murchison's "Siluria." A *Bellerophon*; and several specimens of the common Upper Silurian species of *Favosites* called *Favosites aspera*; a single joint of *Crinoid* stem, probably an *Actinocrinus*." The strike of the beds is meridional.

I have not seen any shells which could be regarded as co-specific with *Cyclonema corallii*, or *Murchisonia corallii*, from the British Ludlow rocks. These are small species and not to be compared to those herein afterwards described.

Prof. R. Tate, F.L.S., has been kind enough to supplement my previous descriptions by notes from specimens in his Collection, which will be found in their proper places. He however remarks of *Niso ? brazieri*:—"I imperfectly observe that the aperture is rounded in front, and not angulated as in the Recent and Tertiary species of *Niso*."

* Records Australian Museum, 1890, I., pt. iii., p. 60.

† The Queen's Birthday Excursion to Lilydale, *Victorian Naturalist*, 1885, II., No. 3, p. 35.

Description of the species :—

Class BRACHIOPODA.

Order CLISTENTERATA.

Family SPIRIFERIDÆ.

Genus Atrypa, Dalman, 1828.

(K. Vet. Acad. Handl., 1827, p. 102.)

ATRYPA RETICULARIS, Linn.

A. reticularis (Linn.), Davidson, Mon. Brit. Sil. Brachiopoda, 1867

Pt. ii., p. 129 (for synonymy), t. 14, f. 1 - 22.

Obs.—This protean species is numerously represented in the Lilydale Limestone, Prof. Tate informs me. We have one example.

Class PELECYPODA.

Order MYTILACEA.

Family AVICULIDÆ.

Genus Ambonychia, Hall, 1847.

(Pal. N. York, I., p. 163.)

AMBONYCHIA ? POSTSTRIATA, sp. nov.

(Pl. xviii., figs. 1 and 2.)

Sp. Char.—Shell deltoid, or triangularly-mytiliform, alate posteriorly, truncate anteriorly. Valves convex in the umbonal region; hinge line straight; ventral margin convex, rounding fore and aft insensibly into the anterior and posterior margins; anterior alation wanting, the margin truncated, and somewhat incurved, straight walled, and with a large, deeply excavated byssal notch, cordate when the valves are in apposition; posterior end alate, more or less flattened, but no concavity along the posterior slope; umbones sharp, prominent, and elevated above the hinge line, slightly incurved; body of the shell gently convex from the umbones downwards to the ventral margin. Sculpture consisting of coarse concentric laminae of growth, uncrossed by any radiating or decussating striae, except on the posterior slope, which is finely radiate, the intersection with the concentric laminae giving rise to a fine fimbriation.

Obs.—The genus *Ambonychia* possesses two allies, *Anomalodonta*, Miller, and *Opisthoptera*, Meek, greatly resembling it in external appearance, but differing in the internal structure of the hinge, and to either of which the present species might equally well be referred, but as we are quite ignorant of the characters of the dorsal margin, I have thought it better to provisionally place the shell in the genus in chief. It differs, however, from all three, in

the surface of the valves being only partially, instead of wholly radiate, but the deltoid outline, truncate anterior end, and elevated beaks are very characteristic features of all three genera and the present species.

In dealing with the mollusca of a comparatively new region, and an almost unworked horizon, it is difficult to adopt many known genera, on imperfect and incomplete materials, and it is possible, therefore, that *A. ? poststriata* may represent an undescribed and peculiarly Australian genus.

When the shell is viewed looking at the anterior end, the latter is seen to be flattened, or as I have described it above, straight-walled, and the byssal opening to be large and somewhat cordate. The form of this opening is quite in keeping with the structure of *Ambonychia*, an excellent figure being given by Hall in his "Supplementary note on the Genus *Ambonychia*,"* which exemplifies it. The figured valve of *A. ? poststriata*, the left one, is three and three-quarter inches long, by three inches high, and with a diagonal measurement of three and three-quarter inches. The concentric sculpture of our species is similar to that of *Ambonychia ? triton*, Salter, † and so is the outline, but the posterior slope of the latter is not radiate.

Prof. Tate writes me that he possesses an *Ambonychia*-like shell from Lilydale, with fenestrated ornament. It can hardly be *A. ? poststriata*, which is fenestrate only on the posterior slope. He also informs me that the Rev. Mr. Cresswell gave him a small, neat *Conocardium* from the same locality.

Class GASTEROPODA.

Order PROSOBRANCHIATA.

Family LITTORINIDÆ.

Genus *Cyclonema*, Hall, 1852.

(Pal. N. York, II., p. 89.)

CYCLONEMA AUSTRALIS, Eth. fil.

(Pl. xix., figs. 1 and 2.)

C. ? australis, Eth. fil., Records Austr. Mus., 1890, I., pt. iii., p. 63, t. xix., f. 4 and 5.

Obs.—I take this opportunity of figuring a far better specimen of this species than I was formerly able to do. From it the following characters are deduceable. The whorls are six in number, the body whorl being somewhat inflated. The spiral ridges in this particular specimen are alternately larger and smaller, and

* Pal. N. York, III., pt. i., p. 523, f. 2.

† Mem. Geol. Survey Gt. Brit., II., pt. i., t. 23, f. 5.

with the intervening valleys roughened by oblique finer striæ, passing from before backwards. The peristome is round, sharp at the edge, and bevelled inwards. The columellar margin is somewhat flattened, and a decided callosity is present.

Prof. R. Tate writes me as follows regarding this shell:—"The shell is imperforate, and the columella is large and medially depressed—it is related to *Littorina*, and not to *Turbo*." Dr. Paul Fisher,* describes *Cyclonema* as imperforate, or slightly umbilicate; on the other hand Mr. G. W. Tryon, Junr.,† places *Cyclonema* in the Littorinidæ. As the specimen now figured favours this view, it is so assigned.

CYCLONEMA LILYDALENSIS, *sp. nov.*

(Pl. xix., fig. 3.)

Sp. Char.—Shell with the general characters of the preceding species but the upper whorl smaller in proportion to the size of the body whorl, with a much larger number, and finer spiral ridges, their rounded outline, and a more channeled appearance to the intervening valleys. The oblique decussating striæ are finer and less distinct.

Obs.—This is either a distinct species, or a very well marked variety. I am inclined to the former opinion, fortified by that of my colleague Mr. C. Hedley, F.L.S. In form and character of the spiral sculpture *C. lilydalensis* resembles *C. Guilleri*, Ehlert‡ from the Devonian of Ebray, France, and equally so in the last named character *C. zonatum*, Lindström,§ from the Wenlock rocks of Gotland.

Family PLEUROTOMARIIDÆ.

Genus *Phanerotrema*, *Fischer*, 1885.||

PHANEROTREMA AUSTRALIS, *sp. nov.*

(Pl. xix., figs. 4 and 5.)

Sp. Char.—Shell rhomboid-ovate, spire short, whorls four, the upper small, the last or body whorl inflated; sutures channeled; band wide, flattened, bordered by fine keels, and ornamented with equidistant backwardly-concave rugæ, on the upper whorls just above the suture, and on the body whorl almost median in position,

* *Man. Conchyl. et de Pal. Conchyl.*, 1887, p. 814.

† *Struct. and Syst. Conchology*, 1883, II., p. 241.

‡ *Faune du Calcaire d'Erbray*, 1889, p. 220, t. 15, f. 10.

§ *Sil. Gastropoda and Pteropoda of Gotland*, 1884, p. 178, t. 18, f. 43, 44.

|| See *Fischer's Man. Conchyl. et de Pal. Conchyl.*, 1887, p. 851.

the lower bounding keel forming the greatest periphery of the shell. Sculpture of equal, equidistant, primary spiral ridges, with intermediate finer secondary ones, and the valleys concave, the whole crossed by slightly oblique lines, dividing the surface into a decussation of unequal rhomboidal spaces.

Obs.—*Phanerotrema* is a genus established by Dr. Paul Fischer to receive *Pleurotomaria labrosa*, Hall,* and other Pleurotomaroid shells resembling it, such as *Pleurotomaria balteata*, Phill.† It would appear to be a very necessary and good subdivision of the larger and more comprehensive genus *Pleurotomaria*, and will include those species with a rhomboidally ovate form, and more or less carinate body whorl, arising from the prominence of the band.

Like *P. labrosa*, Hall, sp., our species attained a considerable size, as evinced by the well marked, but imperfectly preserved shell represented in Pl. xix., fig. 4. It appears to be a more obliquely elongated shell than *P. labrosa*, with a narrower band, although larger in size, and a finer ornament. The American species is from the Upper Pentamerus Limestone of New York State, an horizon equivalent to that of the British Ludlow rocks.

As regards the British species, *P. australis*, is decidedly a more depressed shell with smaller upper whorls. The former is from the Wenlock Limestone.

Genus Murchisonia, d'Archiac and De Verneuil, 1841.

(Bull. Soc. Géol. France, XII., p. 154.)

MURCHISONIA, *sp. ind.*

Obs.—Ill-preserved examples, either too imperfect, or too much defaced with matrix, to be determinable, are in the Collection. The species has some points of resemblance with *Murchisonia cingulata*, Hisinger,‡ but the angularity of the whorls and position of the band do not coincide with those features of that species. The same may be said of another allied shell *M. sinuosa*, Sby., sp.§ Our species appears to me, on the other hand, to be allied to *Murchisonia attenuata*, His.,|| in which the band is nearly median in position; the only point of difference I am able to indicate being the somewhat more angular whorls on the Gotland shell. Otherwise the latter and our *Murchisonia* appear to be closely allied.

* Pal. N. York, 1859, III., p. 339, Atlas t. 66, f. 1 - 5.

† Mem. Geol. Survey Gt. Brit., 1848, II., Pt. i., p. 358, t. 15, f. 1—2.

‡ See Murchison's Geol. Russia, 1845, Pt. iii., t. 22, f. 7a and b; Lindström's Sil. Gastropoda and Pteropoda of Gotland, 1884, t. 12, f. 9.

§ Salter, Mem. Geol. Survey Gt. Brit., 1848, II., Pt. i., p. 357, t. 14, f. 2.

|| Lindström, *loc. cit.*, t. 12, f. 20 and 21.

Family BELLEROPHONTIDÆ.

Genus Bellerophon, *De Montfort*, 1808.

(Conch. Systématique. I., p. 51.)

BELLEROPHON CRESSWELLI, *sp. nov.*

(Pl. xix., figs. 6 - 8.)

Sp. Char.—Shell globular, but little compressed at the sides, carinate, the mouth expanded, more so transversely than vertically. Whorls five or six, the inner concealed by the body whorl, which expands rapidly. Mouth rhomboidal; outer lip rather thickened above, increasing at the sides, the thickened edge rounded or bevelled slightly outwards; inner lip much reflected, forming a deep callosity; band raised and flattened, narrow, bordered by fine keels; sinus long and narrow, rendering the outer lip slightly emarginate in the middle line: umbilicus probably a little open. Sculpture of irregular, fine, transverse laminae of growth, but without spiral lines, and in consequence the surface unfenestrate.

Obs.—A *Bellerophon* without specific name is recorded by Mr. Cresswell, and I find much pleasure, therefore, in associating his name with this shell. *B. cresswelli* resembles in general form and sculpture *B. squamosus*, Lindström,* from the Wenlock rocks of Gotland, but differs from that species in the outline of the mouth, the lips less reflected, the sculpture is finer, and the surface unfenestrate.

A MUCH THICKENED VARIETY OF *BULIMUS BIVARICOSUS*, GASKOIN, FROM LORD HOWE ISLAND.

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(Plate xx.)

IN the general Zoology of Lord Howe Island,† I applied the varietal name *solida* to a peculiar form of *Bulimus bivaricosus*, Gaskoin, one of the most characteristic species in the land molluscan fauna of the island in question. In the living state, there are already known two well marked varieties *Bulimus cunicul-insular*, Cox,‡ and *B. etheridgei*, Brazier,§ the former being less in size, the latter with a much thinner shell than the species in chief.

* Sil. Gastropoda and Pteropoda of Gotland, 1884, p. 78, t. 5, f. 17 - 24.

† Lord Howe Island, Its Zoology, Geology, and Physical Characters, *Mem. Austr. Mus.*, No. 2, 1889, p. 27.

‡ Proc. Zool. Soc., 1872, p. 19, t. 4, f. 3.

§ Lord Howe Island, *loc. cit.*, t. 5, f. 1, 2, 7, 8.